

## The Impact of Domestic and Direct Foreign Investment on the Economic Growth in Sudan: Evidence from Granger Causality and VAR Framework

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### Abstract

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Foreign Direct Investment and Domestic Investment provide a crucial basis for economic development of any country. This study examines the causes and impacts of Real Gross Domestic Product (RGDP), Real Domestic Investment (DI) and Real Foreign Direct Investment (FDI) in Sudan for the period from 1990 to 2011. The importance of this study stems from the vital role of investment (domestic and foreign) in the development process through enhancing economic growth, improving infrastructure and achieving welfare. This study adopted Vector Autoregressive Model and Granger Causality Test (1969). The study depended on secondary data collected from Central Bank of Sudan and Central Bureau of Statistics. Our empirical evidence suggests that the causality directions running positively in the period (1990-2011). There is unidirectional causality of Foreign Direct Investment (FDI) to Real Gross Domestic Product (RGDP), from Real Gross Domestic Product (RGDP) to Foreign Direct Investment (FDI), from Domestic Investment (DI) to Real Gross Domestic Product (RGDP), from real gross domestic product (RGDP) to domestic investment (DI), from foreign direct investment (FDI) to domestic investment (DI), and from domestic investment (DI) to foreign direct investment (FDI). Granger causality results show that there are no statistically significant implications of the independence causality relationship between Domestic Investment (DI) and Real Gross Domestic Product (RGDP), Real Gross Domestic Product (RGDP) to Domestic Investment (DI), Foreign Direct Investment (FDI) to Real Gross Domestic Product (RGDP), Real Gross Domestic Product (RGDP) to Foreign Direct Investment (FDI), Foreign Direct Investment (FDI) to Domestic Investment (DI), and Domestic Investment (DI) to Foreign Direct Investment (FDI). The VAR estimation shows that the coefficients of lagged RGDP significant in the regression of the RGDP, the coefficients of lagged DI significant in the regression of the DI and FDI, the coefficients of lagged DI insignificant in the regression of the RGDP, and the coefficients of lagged FDI insignificant in the regression of the RGDP. The study recommends raising more real financial resources for the purpose of investing in economic and social infrastructure as well as in oil exploration. Industrialization is highly recommended for import substitution purpose and for increasing the value added for Sudan's exports to benefit more from international trade. These require encouraging domestic saving, attraction of foreign funds to supplement the domestic component, strengthening foreign relations, and facilitating the investment procedures and thus achieving economic growth in the country.

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**Keywords:** Foreign direct investment, economic development, causality, Sudan.

### 1 Introduction

Domestic Investment and Foreign Direct Investment are considered the most important economic variables for the economic development of any country. This study examined the causes and impacts of Real Gross Domestic Product (RGDP), Real Domestic Investment (DI) and Real Foreign Direct Investment (FDI) in Sudan for the period from 1990 to 2011. However, Sudan is one of the economies, among fewer developing countries, that have the worst situation of savings and investment.

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Although there is a need to encourage savings via free trade and capital flows, the low level of domestic savings and investment in small developing countries arises due to high unemployment, low income, involvement of population in the informal economy and corruption. Investment is one of the main determinants of the sustainability of economic growth. The importance of investing increases production and productivity, leading to increased national income and higher average per capita and thus improving the standard of living, create jobs to reduce unemployment and poverty rates, which is the feature of the Sudanese economy, which in turn increase domestic investment. Economic growth can be measured either by the growth of total output or of total income. The main target of economic growth is improvement in people's economic well-being: an increase in their standard of living this is achieved by the individuals in a country when output per worker increases over time. The available natural resources in Sudan is sufficient to achieve higher levels of economic growth, which contributes to sustainable economic development, but nevertheless we find that the levels of investment (domestic and foreign) is too low and few of saving as well, which are caused by the state of Sudan being politically and economically instable due to long civil war and other factors. This held back domestic and foreign investment in the country, because political stability is a key factor which encourages investors and increases saving and thus achieves economic growth. This study endeavors to answer the following question: To what extent do domestic investment and foreign direct investment affect economic growth in Sudan?

The significance of this study stems from the important role played by domestic investment, foreign direct investment, in the economic growth which increases productivity and production, leading to increased national income and per capita income and hence improving the standard of living. Therefore, providing job opportunities and reducing the unemployment rate, increased rates of capital, provision of hard currencies by exports, which has a positive impact on the balance of payments and achievement of economic growth rates. The study tries to examine the causal relationship and the linear interdependencies among between Economic Growth, Domestic Investment, and Foreign Direct Investment. Based on Granger causality and VAR model the study attempts to investigate the hypotheses: (1) Real Gross Domestic Product (RGDP) causes Domestic Investment (DI) and Domestic Investment (DI) causes Real Gross Domestic Product (RGDP), (2) 2- Real gross domestic product (RGDP) causes foreign direct investment (FDI) and foreign direct investment (FDI) causes real gross domestic product (RGDP), and (3) 3- VAR model assumes that all variables are endogenous where each variable is explained by its own lags and the lags of the others.

## 1.6 Research methodology

The study adopted the Vector Autoregressive Model (VAR) and Granger (1969) causality test, selection of information criteria is applied to annual time series data obtained from the Central Bureau Of Statistics and Central Bank of Sudan for the period extended from (1990- 2011).

## 2. Literature review

Musa (2015) noted that foreign direct investment (FDI) is needed for a country to achieve a sustainable high trajectory of economic growth through transfer of technology, improvement of labor and management skills, assists human capital formation and contributions to international trade integration and particularly exports. One of the economic problems of Sudan is that it does not have enough saving to finance its investments. However, the investment- saving gap has narrowed considerably since 1990s as a result of the efforts made to improve the business environment with a view to attract (FDI). The significance of study stems from the fact that, in recent years, (FDI) in Sudan is looked at as one of the major sources of getting the required funds for investments, hence, most policymakers have come to the conclusion that (FDI) is needed to boost the growth in Sudan. The aim of the study is to investigate the effect of trade openness on (FDI) in Sudan during the period (1990-2012). Two other variables are incorporated in the empirical model, namely dummy variable for economic liberalization policy (L) and real per capita gross domestic product (GDP). To this end, the study used Ordinary Least Squares (OLS) Method and annual time series data obtained from different sources, including: the annual reports of the Central Bank of Sudan, World Bank indicators and Central Bureau of Statistic. The results indicate that trade openness contributes positively and significantly to the inflows of (FDI) in Sudan besides that, real per capita GDP is the most significant. One among these determinants liberalization policy which turned out to be the most important factor affecting (FDI) inflows in Sudan during the study period, regarding the magnitude of the estimated coefficients. Therefore, we recommended that Sudan should build strong relations with all economical and financial international firms and corporations, especially with superpowers as well as direct the foreign direct investment to other sectors, especially the agricultural sector with expanding and developing the local market so as to be greater than it was in the past years.

Abdelmawla (2011) argued that Granger causality test between economic growth and domestic investment, and the impacts of investment rate and the degree of trade openness on economic growth in Sudan over the period (1990-2009). The empirical results revealed that real GDP and real investment in Sudan showed significant positive trends over the period under investigation. Furthermore, the Granger causality test showed that real investment causes economic growth, with the F-ratio significant at (10%), while economic growth is found to be statistically insignificant in enhancing real investment. The empirical results further signified that both the coefficients of the investment rate and trade openness are statistically significant at (1%) in stimulating the economic growth. However, the magnitude or the coefficient of trade openness is quite small. The study recommended raising more real financial resources for the purpose of investing in economic and social infrastructure as well as in oil exploration. Industrialization is highly recommended for import substitution purpose and for increasing the value added for Sudan's exports so as to benefit more from trade. These require encouraging domestic saving, attracting foreign funds, strengthening foreign relations, and facilitating the investment procedures.

Abedlghani (2002): This study sought to estimate the relationship between domestic saving measured by growth rate of domestic saving (st) and economic growth measured by growth rate of real gross domestic product (gt) in Sudan for the period (1982-1999). The test of causality carried out in time-series settings. Unlike previous studies, this study tests an alternative hypothesis: that higher growth rates of real gross domestic product causes growth rate of domestic saving. The direction of causality is investigated using Ordinary Least Squares (OLS) estimator, and Hisao's (1971,1981) testing procedure which is a combination of Granger's (1969) causality test and A kaiké's (1969) final prediction Error (FPE) criterion. The empirical results tend to greatly support to the hypothesis that there is a two-way causation (feedback effect) between saving and economic growth. That is, the two variables are both cause and effect of each other. Policymakers should attach equal importance to policies, which provide higher saving, and investment as a consequence of higher economic growth and not its primary cause only.

Paul and Milanzi (2016) examined, from an empirical point of view, the causes and impacts between economic growth, Foreign Direct Investment, Trade, and Domestic Investment in Tanzania to ascertain the causal relationships using annual time series data from 1970 to 2012. The data was collected from various publications of the Tanzania's National Bureau of Statistics, United Nations Statistics Division, and the African Development Bank. All variables were not stationary at their level forms but were stationary at the first difference, hence they were integrated of order one I (1). Accordingly, we adopted Johansen's Test for Cointegration to determine the long-run relationship. The test identified two cointegrating vectors in the system indicating the existence of long-run equilibrium relationships. The presence of long-run relationships among the variables also indicates the existence of causal relationships. We then adopted the Granger causality test whose results revealed strong support for the FDI-led exports, export-driven FDI, growth-driven FDI, export-led growth, and growth-driven exports hypotheses for Tanzania. It further revealed that domestic investment causes economic growth in Tanzania, suggesting that policies should encourage domestic investment.

Ruranga et al (2014) analyzed real Gross Domestic Product (GDP), Domestic Investment (DI), Foreign Direct Investment (FDI), Domestic Savings (DS) and Trade (TR) in Rwanda for the period 1970 to 2011. GDP and DI have an upward trend and annual growth of real GDP was around 8% in average for all period. FDI and DS have remained below 2% of GDP each and trade balance of Rwanda is always negative. Augmented Dickey-Fuller (ADF) tests show that GDP, DI and FDI are not stationary at the level but the first differences are stationary. VAR (1) was identified as the appropriate model according to Akaike information criterion, Schwarz information criterion and Hannan-Quinn information criterion. Granger causality tests show that there is bi-directional causality from GDP and TR and TR and DI, and unidirectional causality from GDP to DI, from DS to GDP, from DS to DI and from DS to TR. These findings show that GDP can be used to promote Domestic Investment and Trade. Domestic savings have significant effects on GDP, DI and TR. VAR was estimated and the forecasted values of GDP, DI and FDI in 2011 show that there is under-prediction for GDP, DI and FDI. The differences can be explained by the efforts of the Government of Rwanda to promote GDP, Domestic Investment and Foreign Direct Investment. Adhikary (2011) tested the relationship among foreign direct investment (FDI), trade openness, investment and economic growth in Bangladesh for the years 1986–2008 by using the Johansen–Juselius and vector error correction model.

The results revealed that a one-way causal and strong long-run relationship exists among GDP growth rates, FDI, trade openness and investment with unidirectional casual flows.

### 3. Sudanese economy: background

This section aims to show the characteristics and the structure of the Sudanese economy and to explain the major sectors which play a vital role in Sudan's economy, namely the agricultural sector, industrial sector and services sector.

#### 3.1 The agricultural sector

The agriculture sector is the most important economic sector in the country. It contributes by an average about 43% of the country's Gross Domestic Product (GDP) during the period 1999-2011 (Table.1). The sector provides employment for about 70 percent of the country's population, and provides inputs to many major manufacturing industries (e.g. edible oils, leather, and sugar). Historically, agriculture generated the bulk of Sudan's foreign exchange earnings through a diversified basket of exports, i.e. agricultural exports were the main source of foreign currency before oil exploitation in 1999, which can be broadly classified into three categories that include field crops exports, animal and forest exports. The major field crops include sorghum, millet, cotton, sesame and ground nut, while animal exports include sheep, camels and cattle, and, gum Arabic is considered the major forest export. Agricultural exports are now lower than they used to be the years ago (CBOS, 2006). With regard to the contribution of the agricultural sector to exports, there has been a sharp decline in the contribution of products. The total agricultural exports have coincided with the beginning of the export of oil which is a significant boost for exports. However, after the loss of oil revenues, the contribution of agricultural exports is far from the level at which it was. At the beginning of the nineties, the livestock also decreased by 35 million heads due to the secession of the south, which led to a lack of attention to the quality of production and weak infrastructure and consequently affected the marketing of products in the regional and international markets and thus weak openness to the outside world.

**Table.1: Contribution of agriculture sector in the GDP, agriculture exports and exports share in total exports in Sudan (1999-2011)(Average per four years)**

Year	Share of Agriculture in GDP (%)	Agriculture Exports (Million USD)	Share of Agriculture Exports in Total Exports (%)
1999	49.80	405.29	52.0
2000-2003	45.92	337.16	16.95
2004-2007	37.70	475.71	9.8
2008-2011	30.50	607.76	4.85

Source: Central Bank of Sudan, Annual reports

#### 3.2 Industrial sector

One of the most visible results of development in Sudan is the growth of industry. Industrialization started in Sudan by establishing a cement factory in 1918. Food processing industry started in the 1940s by vegetable oil extraction and laundry soap production. In addition, there were many traditional handicraft industries. The ginning of cotton encouraged the beginning of industry in Sudan in the early 20th century. Petroleum exploration and refinery is the major resource in Sudan's industry sector. While Sudan has been an oil producer for decades, the nation began exporting oil only after 1999. Sudan had oil reserves of over 6.8 billion barrels in 2010, accounting for 0.49% of total world fact book. Presently, oil accounts for over three-quarters of Sudan's total exports. Compared with Japan, South Korea, China, Indonesia and India, Sudan is the key oil importer (CIA, 2017). Sudan's economy has undeniably suffered some terrible shocks in the past decade, namely the global financial crisis and the secession of South Sudan in 2011, which caused Sudan to lose more than 80% of its oil fields. Mohamed and Abu-Bakr (2015) discussed the industrial investment structure in Sudan by focusing on sugar industry and its participation in economic development. That is by the way of the activation of industrial investment function in order to support the national economy. First we discussed the industrial investment function and weakness in the Sudanese economy. The analysis revealed that sugar sector incurs high cost in production compared with unexploited power. The significance of the paper stems from the recognition of function played by the industrial sector in ameliorating the GDP, which is essential to satisfy the commercial balance, economic stability and generate employment opportunities. The financing weakness in the industrial sector decreased due to decreased investment volumes in the Sudanese economic.

The paper adopted the descriptive analytical approach to analyze the sufficient data and information during the period (2000-2011). There were important results and indicators for the qualitative development of the industrial sector. One of them is the spread of productive industries. There are indicators of mass capital inflows to industrial investment, especially the agricultural industry which is connected by successful comprehensive agricultural mobilization program, especially in the previous years as inspired by improvements in imports and production schedule.

### 3.3 Services sector

The contribution of services sector to the GDP suffered in the early and mid-1990s but appeared to be improving by the end of the decade for 40.6 percent of the GDP, but services in 1999 accounted for only 34.4 percent. By 1998, services had increased to 44 percent of the GDP (World Fact Book). Services include commerce and commerce services, restaurants and hotels, finance and insurance, transport and communications, and government offices (CBOS, 2000).

## 4. Methodology and the empirical results

This section briefly outlines the research methodology that will be used in the analysis, findings and empirical results. Firstly, the research provides the model adopted in this study in order to examine the existence of causal relationship between Real Gross Domestic Product, Domestic Investment and Foreign Direct Investment, by using Vector Autoregressive Model (VAR) and Granger causality test

### 4.1 Granger Causality Test

The Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another, first proposed in 1969. Ordinarily, regressions reflect "mere" correlations, but Clive Granger argued that causality in economics could be tested by measuring the ability to predict the future values of a time series using prior values of another time series. Econometricians assert that the Granger test finds only "predictive causality". A time series X is said to Granger-cause Y if it can be shown, usually through a series of t-tests and F-tests on lagged values of X (and with lagged values of Y also included), that those X values provide statistically significant information about future values of Y.

We used The Granger causality test which involves estimating the following pair of regressions:

$$y_t = \sum_{i=1}^n \alpha_i x_{t-i} + \sum_{j=1}^n \beta_j y_{t-j} + \varepsilon_{1t} \quad (i)$$

$$x_t = \sum_{i=1}^n \varphi_i x_{t-i} + \sum_{j=1}^n \delta_j y_{t-j} + \varepsilon_{2t} \quad (ii)$$

With the assumption that the disturbances  $\varepsilon_{1t}$  and  $\varepsilon_{2t}$  are uncorrelated. We distinguish four cases:

1. Unidirectional causality from  $x_t$  to  $y_t$  is indicated if the estimated coefficients on the lagged  $x_t$  in (i) are statistically different from zero as a group ( $\sum_{i=1}^n \alpha_i \neq 0$ ) and the set of estimated coefficients on the lagged  $y_t$  in (ii) is not statistically different from zero ( $\sum_{j=1}^n \delta_j \neq 0$ )
2. Unidirectional causality from  $y_t$  to  $x_t$  is indicated if the estimated coefficients on the lagged  $y_t$  in the (ii) are statistically different from zero as a group ( $\sum_{j=1}^n \delta_j \neq 0$ ) and the set of estimated coefficients on the lagged  $x_t$  in (i) is not statistically different from zero ( $\sum_{i=1}^n \alpha_i \neq 0$ )
3. Bilateral causality is indicated when the set of  $x_t$  and  $y_t$  coefficients are statistically different from zero in both regression equations (i) and (ii).
4. Independence – occurs when the set of  $x_t$  and  $y_t$  coefficients are not statistically significant in both regression equations (i) and (ii).

In all four cases it is assumed that the two variables are stationary.

### 4.2 Stationary Vector Autoregressive Model (VAR)

VAR models allow interpretations on the dynamic relationship between the variables. The VAR model of economic growth, Domestic Investment, Foreign Direct Investment, as:

$$GDP_t = \delta_1 + \sum_{i=1}^P \beta_{1i} GDP_{t-i} + \sum_{i=1}^P \beta_{2i} DI_{t-i} + \sum_{i=1}^P \beta_{3i} FDI_{t-i} + U_{1t} \quad (1)$$

$$DI_t = \delta_2 + \sum_{i=1}^P \alpha_{1i} GDP_{t-i} + \sum_{i=1}^P \alpha_{2i} DI_{t-i} + \sum_{i=1}^P \alpha_{3i} FDI_{t-i} + U_{2t} \quad (2)$$

$$FDI_t = \delta_3 + \sum_{i=1}^P j_{1i} GDP_{t-i} + \sum_{i=1}^P j_{2i} DI_{t-i} + \sum_{i=1}^P j_{3i} FDI_{t-i} + U_{3t} \quad (3)$$

Where:  $\delta$ ,  $\beta$ ,  $\alpha$ ,  $j$ , are parameters.

RGDP: Represents Real Gross Domestic Product.

DI: Domestic Investment.

FDI: Foreign Direct Investment.

U: are the stochastic error terms.

Assumptions about the error terms:

1. The expected residuals are zero:  $E(U_{1t}) = E(U_{2t}) = E(U_{3t}) = 0$

2. The vector error terms are not auto-correlated:

$$E(U_t U_s) = \sigma_i^2 \text{ if } s=t, \quad E(U_t U_s) = 0 \text{ if } s \neq t$$

Different tests were conducted using equations (1) to (3) in order to analyse the dynamic relationship between those variables

## 5. The Empirical Results

Table 2 illustrates Granger causality tests results for the period (1990-2011). The results showed that there is not statistically significant implies the independence causality relationship from domestic investment(DI) to real gross domestic product(RGDP), from real gross domestic product(RGDP) to domestic investment(DI), from foreign direct investment (FDI) to real gross domestic product(RGDP), from real gross domestic product(RGDP) to foreign direct investment (FDI), from foreign direct investment (FDI) to domestic investment(DI), and from domestic investment(DI) to foreign direct investment(FDI).

**Table 2. Causality Test Result**

Null Hypothesis:	Obs	F-Statistic	Prob.
DI does not Granger Cause RGDP	21	3.10614	0.0950
RGDP does not Granger Cause DI		1.42899	0.2474
FDI does not Granger Cause RGDP	21	3.90914	0.0635
RGDP does not Granger Cause FDI		0.60531	0.4467
FDI does not Granger Cause DI	21	0.24808	0.6245
DI does not Granger Cause FDI		3.31526	0.0853

Additionally VAR model is used to determine the interrelationships among the variables. The results shown in Table 3 show the results. It is very clear that: the coefficients of lagged RGDP significant in the regression of the RGDP. The coefficients of lagged DI significant in the regression of the DI and FDI. The coefficients of lagged DI insignificant in the regression of the RGDP. The coefficients of lagged FDI insignificant in the regression of the RGDP.

**Table 3. Vector Auto Regression (VAR) Results**

	RGDP	DI	FDI
RGDP(-1)	0.909024 (0.06865) [ 13.2406]	2.596998 (2.34530) [ 1.10732]	-2.331227 (1.49897) [-1.55522]
DI(-1)	0.007660 (0.00736) [ 1.04056]	0.690009 (0.25148) [ 2.74374]	0.368186 (0.16073) [ 2.29066]
FDI(-1)	0.013219 (0.00993) [ 1.33069]	-0.116755 (0.33936) [-0.34404]	0.221297 (0.21690) [ 1.02028]
C	0.994083 (0.55711)	5.858496 (19.0316)	22.71849 (12.1638)

	[ 1.78435]	[ 0.30783]	[ 1.86771]
R-squared	0.986260	0.837046	0.488658
Adj. R-squared	0.983835	0.808290	0.398421
Sum sq. resids	12.91461	15071.09	6156.488
S.E. equation	0.871598	29.77474	19.03014
F-statistic	406.7539	29.10807	5.415284
Log likelihood	-24.69299	-98.84583	-89.44547
Akaike AIC	2.732666	9.794841	8.899569
Schwarz SC	2.931623	9.993797	9.098525
Mean dependent	17.12305	126.8252	37.05738
S.D. dependent	6.855387	68.00260	24.53555
Determinant resid covariance (dofadj.)		186815.1	
Determinant resid covariance		99106.21	
Log likelihood		-210.1846	
Akaike information criterion		21.16044	
Schwarz criterion		21.75731	

Sample (adjusted): 1991 2011

Included observations: 21 after adjustments

Standard errors in ( ) & t-statistics in [ ]

## 6. Discussion

The economic theory states that there is a positive relationship between Real Gross Domestic Product (RGDP) and Domestic Investment (DI) and Foreign Direct Investment (FDI). That means the variables (DI) and (FDI) positively affect (RGDP). However, in this study, Granger causality and VAR model results show that there is no relationship between Real Gross Domestic Product (RGDP) and Foreign Direct Investment (FDI) and Domestic Investment (DI) in Sudanese economy. This is because there are many problems within Sudanese economy, mainly:

1. The economic policies do not encourage the domestic investment and foreign direct investment; by allocating more real financial resources for the purpose of investment, especially in agricultural sector.
2. The weakness of infrastructure in the country such as telecommunication, information, technology, roads, electricity and water.
3. The weakness of social infrastructure, lack of training human resources, and shortage in the dissemination of knowledge and technological progress.
4. The shortage in national savings to fund the investments.
5. The secession of South Sudan and internal war in Darfur led to sharp fluctuations in the economy.
6. There are some variables which negatively affect the accumulation of capital and then domestic investment and foreign direct investment such as interest rate, money supply, taxation, government expenditure, high rate of inflation, the instability of the exchange rate and lack in savings, unemployment and poverty. All these reasons lead to decline in investments.
7. The foreign trade, which can promotes the efficient allocation of resources through comparative advantage, is too weak.
8. The weak competition in domestic and international markets.
9. Political problems.
10. Weak economic relationships with economical and financial international firms and corporations, especially with superpowers.
11. Financial and administrative corruption.
12. Debt crises lead to negatively affects in economic and trade openness.
13. Structural problems of the Sudanese economy.

## 7. Conclusion and Recommendations

### 7.1 Conclusion

The present study aimed at conducting an analysis of Economic Growth, Domestic Investment, and Foreign Direct Investment in Sudan. To this end, we adopted Granger causality and Vector Autoregressive Model (VAR) test is applied to annual time series data covering the period (1990- 2011) to estimate the relationship between economic growth and Domestic Investment (DI), Foreign Direct Investment (FDI). Data were collected from the Central Bureau of Statistics and Central Bank of Sudan. The regression results revealed that there are no statistically significant implications of the independence causal relationship from Domestic Investment (DI) to Real Gross Domestic Product (RGDP) and from Real Gross Domestic Product (RGDP) to Domestic Investment (DI), also from Foreign Direct Investment (FDI) to Real Gross Domestic Product (RGDP) and from Real Gross Domestic Product (RGDP) to Foreign Direct Investment (FDI), also from Foreign Direct Investment (FDI) to Domestic Investment (DI), and from Domestic Investment (DI) to Foreign Direct Investment (FDI). The VAR estimation shows that the coefficients of lagged RGDP significant in the regression of the RGDP, the coefficients of lagged DI significant in the regression of the DI and FDI, the coefficients of lagged DI insignificant in the regression of RGDP and the coefficients of lagged FDI insignificant in the regression of RGDP.

### 7.2 Policy recommendation

Based on the conclusion and analysis carried out in this study, the following recommendations are imperative to improve the economic growth in Sudan.

1. Policymakers should allocate more real financial resources for the purpose of investment, and design proper policy measures to increase and encourage domestic saving and transmit those savings into investment properly.
2. Improving infrastructure in the country such as telecommunication, information, technology, roads, electricity and water.
3. Raising more real financial resources for the purpose of investing in economic and social infrastructure and training human resources as well as in oil exploration. Industrialization is highly recommended for importing substitution purpose and for increasing the value added for Sudan's exports so as to benefit more from trade. These require encouraging domestic saving, attracting foreign funds, strengthening foreign relations, and facilitating the investment procedures.
4. Realizing peace nationwide.
5. Encouraged foreign trade and financial openness to accelerate investment.
6. Building strong relations with all economical and financial international firms and corporations, especially with superpowers, as well as directing foreign direct investment to other sectors, especially agricultural sector which expands and develops the local market so as to be greater than it was in the past years.
7. Solving political problems.
8. Adopting both monetary and fiscal policies to control inflation so as to stimulate economic growth, at the same time to develop the infrastructure in the country.
9. Institutional development such as improvement in law and order.
10. Redirecting government consumption expenditure to local resources so as to pave the way for fostering growth in the country.
11. Attaching equal importance to policies, which provides higher saving, and investment as a consequence of higher economic growth.
12. If foreign capital complements domestic capital, FDI will have greater influence on output growth.
13. If FDI expands the variety of intermediate and capital goods, then the productivity level of the recipient country can be enhanced, and thus reduces unemployment by creating job opportunities.

### References

- Haq, M.M. (2008). Growth and Openness: Empirical Evidence from Bangladesh. MPRA Paper 35732. Germany: University Library of Munich
- Herranz-Loncán, A. (2007), "Infrastructure investment and Spanish economic growth, 1850–1935", *Explorations in Economic History*, Vol.44, No. 3, July, pp. 452-46.
- Keynes, J.M. (1936): "General theory on employment, interest and money". Macmillan, London.
- Mahran, H. A. (2007). Public Policy and Poverty Reduction in Sudan, 1971-2002. In Ali. A. A. G. and Fan. S. (eds): *Public Policy and Poverty Reduction in the Arab Region*, Arab Planning Institute, Kuwait.



- Abedlghani.A.M.(2002):“Causality between Domestic Savings and Economic Growth A Case study of Sudan (1982-2000)”University of Khartoum. not Complete .
- Adhikary, B.K.(2011).FDI, trade openness, capital formation, and economic growth in Bangladesh: A linkage analysis. *International journal of Business and management*, 6(1),16-28. Retrieved from <http://www.ccsenet.org/ijbm>.
- Abdelmawla. M. A., Siddig .K.H.A(2009):“Investment And Economic Growth In Sudan Trends And Causal Relationships(1990-2009)”, In *Issues and challenges in rural development: Compendium of approaches for socio- Economic and ecological development in developing countries*, edition: vol,III, chapter:2 ,publisher :margrave publishers, editors: slegfriedbauer, evelinabudjurova, pp.75-87
- Alkhatib. H .B, Altaaleb. G.S, Alokor. S.M(2010),“economical determinants of domestic investment”alahliaamman university- Jordon, *The World Islamic Sciences and Education university*, Aprial edition vol8, No7.
- Attanasio op, picci l, scorcu .a(2000) saving, growth and investment. A. macroeconomic analysis using panel of countries, *Rev Econ stat* 82(2):182-211.<http://citeseerx.ist.psu.edu/viewdoc/summary?doi:10.1.1.202.8869>.
- Elabed . A, “determination of domestic savings in Sudan, 1970-2000, Sudan University of science and technology.
- Nwanne,T.F.I(2014) “Implication Of Saving And Investment On Economic Growth In”, Department of Accounting/Finance, Faculty of Management and Social Sciences Godfrey Okoye University, Enugu,Vol.2, No.4, pp.74-86, December 2014.
- Ogbokor.A.C, and Oscar AndiyaMusilika.A.O (2014)”nvestigating the Relationship between Aggregate Savings and Investment in Namibia: A Causality Analysis ,Department of Economics, Namibia University of Science and Technology, Windhoek, Namibia.
- Ruranga.C, Ocaya.B,Kaberuka.W(2014)” VAR Analysis of Economic Growth, Domestic Investment, Foreign Direct Investment, Domestic Savings and Trade in Rwanda” School of Statistics and Planning, Makerere University, Kampala, Uganda,School of Economics, University of Rwanda, P.O. Box 117, Butare, Rwanda.
- Sheikh Moussa. A. O. (2012). *Economic Reform Methodology: Analytical study of economic development in Sudan (2001-2011)-part two*.
- Paul.F&Milanzi.M(2016)” Economic growth, foreign direct investment, trade, and domestic investment in Tanzania: Integration and causality analyses. *American Journal of Academic Research*, 1, A48-A69. Retrieved from <http://www.ASRAresearch.org/ajar-vol-1-no-1-2016/>
- Hussein. A. A. (2003). *Export Promotion versus Import. Substitution Development Strategies. An Empirical Investigation for Sudan (1960-200t)*. M.Sc. Dissertation. Department of Economics, University of Gezira, Wad Madani. Sudan.
- Mohamed,S.K.(2015):“Some Economic Determinants Of Foreign Direct Investment Inflow In Sudan: in Empirical Investigation(1990 – 2012)”, M.Sc Dissertation , department of economics, University of Gezira, Wad Madani, Sudan.
- Mohamed , Y.I(2007): “ Economic determinants of foreign direct investment inflows into Sudan (1990-2006) ”, M.Sc Dissertation , department of economics, University of Gezira, Wad Madani, Sudan.
- Central Bank of Sudan Annual Report. various issues, Khartoum, Sudan.
- Central Bank Of Sudan, *Elmasrifi Magazine*. Vol 69, September 2013
- Central Bureau of Statistics, Khartoum, Sudan.
- United Nation Conference on Trade and Development(UNCTAD,2010) “Economic Development in Africa Report: South- South cooperation: Africa and the New Formsof Development Partnership”, Geneva ,Switzerland.
- World Bank (2009): “Sudan the Road toward Sustainable and Broad-Based Growth”. *Poverty Reduction and Economic Management, Unit Africa Region*.